Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

TITLE V (DRAFT PERMIT) NO. V-06-001
WACKER POLYMER SYSTEMS, SPRAY DRY PLANT
CALVERT CITY, KENTUCKY
JANUARY 13, 2006
JOSHUA J. HIGGINS, REVIEWER

SOURCE I.D. #: 21-157-00050
SOURCE A.I. #: 39186
ACTIVITY #: APE20040001

SOURCE DESCRIPTION:
The Spray Dry Plant consists of 2 process lines, constructed in 1987 and 1995, which produce a dried emulsion product. The dried emulsion is made by mixing wet emulsion from the Air Products Emulsion Plant, PVOH from the Air Products PVOH Plant, water and some additives batch-wise in tanks then continuously feeding the solution into the Spray Dry Towers, which dry the solution to a powder. The spray dried powder is mixed with a clay filler and processed through a product-recovery baghouse, product filter, screener, and silo before being bagged. Both lines have identical equipment except that the second process line has 2 recycle bins—one for recycled product and one for additives.

Pollutants that are emitted from this source are methanol and vinyl acetate, and particulate.

The Spray Dry Plant was part of Air Products and Chemicals, Inc. (21-157-00009) and ownership was transferred to Wacker Polymer Systems (Wacker) in 1998. This is a renewal of Wacker's initial Title V permit, V-99-057, issued April 12, 2000.

COMMENTS:
Type of control and efficiency:
There are no controls for VOC's or HAP's.
During issuance of the initial Title V permit, the Main Bag Filters used in conjunction with the Spray Dryer process were deemed "vital" to the production of the product as their primary purpose is capture and recycle of product. Therefore, they were not considered control devices. The same determination is being carried over to this renewal permit, so the Main Bag Filter efficiencies are used to develop the PM emission factor for the two lines.

Emission factors and their source:
All emission factors are based on engineering calculations that take into account vendor equipment performance guarantees, raw material data certified by supplier certificates of analysis, and particle size distribution analysis results. Please see the application for calculations supporting the factors for each process.

Applicable regulations:
401 KAR 59:010, *New process operations*, applies to the PM emissions from the Main Bag Filters, the Clay Bins, and the Product Recycle Bins.

401 KAR 63:020, *Potentially hazardous matter or toxic substances*, applies to each process unit which emits or may emit potentially hazardous matter or toxic substances.

Anything unusual about the:

1. Emission Point Numbers and Descriptions.
   The Insignificant Activity section was revised to more accurately reflect the individual pieces of equipment that are on site for each Spray Drying line. As a result, some pieces of equipment are listed in the Insignificant Activities section without specific EP numbers, as the source has not assigned any for them. Additionally, two pieces of equipment (i.e.: the B85 and C24 Mix Tanks) previously included on the Insignificant Activities list have been added to Section B as the result of revised emission estimates indicating they no longer qualify for Insignificant Activity status.

2. Existing Permit Conditions Proposed for Deletion or Revision.
   The source proposed that certain Monitoring and Recordkeeping Requirements from the initial Title V permit dealing with monitoring the differential pressure (DP) in the Tower Main Bag Filters be discontinued. Their main argument for deleting the requirements was since, "…each baghouse compartment is so large (144 individual filter bags), the DP instrumentation is not sensitive enough to detect breakthrough of 1 bag failure in a compartment." They added that, "Even the change in DP with [the Spray Dryer] Tower shutdown stayed within the alarm limits set up to detect baghouse failures."

   The Division does not feel that these requirements should be deleted, and have been retained in the renewal permit. Monitoring DP may not detect failure of an individual bag, but still may be an effective measure for monitoring catastrophic failure of the Tower Main Bag Filters, or breakthrough of multiple bags occurring at the same time. Additionally, DP provides the only means of monitoring system performance during periods of darkness when Method 22 and/or 9 readings are not possible. Finally, the DP staying within the alarm limits even with the Spray Dryer Tower shut down seems to indicate that perhaps an inadequate baseline pressure drop value has been established. The Division suggests contacting the vendor and/or a consulting firm specializing in baghouse operation to verify the indicator ranges monitored.

3. Non-applicable Regulations.
   401 KAR 57:002, *40 CFR Part 61 national emission standards for hazardous air pollutants*, incorporating by reference 40 CFR 61.240 to 61.247 (Subpart V), *National Emission Standard for Equipment Leaks (Fugitive Emission Sources)*, does not apply because the source is not subject to any other Part 61 rules.

401 KAR 59:050, *New storage vessels for petroleum liquids*; 401 KAR 60:005, *40 CFR Part*

60 standards of performance for new stationary sources, incorporating by reference 40 CFR 60.110 to 60.113 (Subpart K), *Standards of performance for storage vessels for petroleum liquids for which construction, reconstruction, or modification commended after June 11, 1973 and prior to May 19, 1978*, and 40 CFR 60.110a to 60.115a (Subpart Ka), *Standards of performance for storage vessels for petroleum liquids for which construction, reconstruction, or modification commended after May 18, 1978 and prior to July 23, 1984*; and 401 KAR
61:050, *Existing storage vessels for petroleum liquids*, do not apply to any of tanks due to their construction date and/or because they do not store "petroleum liquid" as defined in those regulations.

401 KAR 60:005, *40 CFR Part 60 standards of performance for new stationary sources*, incorporating by reference 40 CFR 60.110b to 60.117b (Subpart Kb), *Standards of performance for volatile organic liquid storage vessels (including petroleum liquid storage vessels) for which construction, reconstruction, or modification commended after July 23, 1984*, does not apply to any of the tanks because of either one or a combination of the following: the tanks do not meet the "storage vessel" definition and/or meet the exception listed in 60.110b(b).

401 KAR 60:005, *40 CFR Part 60 standards of performance for new stationary sources*, incorporating by reference 40 CFR 60.480 to 60.489 (Subpart VV), *Standards of performance for equipment leaks of VOC in the synthetic organic chemicals manufacturing industry*, does not apply to the source because they do not produce a product or intermediate as listed in 40 CFR 60.489.

401 KAR 60:005, *40 CFR Part 60 standards of performance for new stationary sources*, incorporating by reference 40 CFR 60.560 to 60.566 (Subpart DDD), *Standards of performance for volatile organic compound emissions from the Polymer Manufacturing Industry*, does not apply to the source because the source does not produce polypropylene, polyethylene, polystyrene, or poly (ethylene terephthalate) as defined in 40 CFR 60.561.

401 KAR 60:005, *40 CFR Part 60 standards of performance for new stationary sources*, incorporating by reference 40 CFR 60.700 to 60.708 (Subpart RRR), *Standards of performance for volatile organic compound emissions from synthetic organic chemical manufacturing industry (SOCMI) reactor processes*, does not apply to the source because the source does not produce products listed in 40 CFR 60.707.

401 KAR 61:175, *Leaks from existing synthetic organic chemical and polymer manufacturing equipment*, does not apply to the source because the source is not a "synthetic organic chemical manufacturing plant" or a "polymer manufacturing plant" as defined in the regulation, was commenced after the classification date, and is not located in an ozone nonattainment area.

401 KAR 63:002, *40 CFR Part 63 national emission standards for hazardous air pollutants*,

incorporating by reference 40 CFR 63.100 to 63.107 (Subpart F), N*ational emission standards for hazardous air pollutants from the synthetic organic chemical manufacturing industry*, does not apply to the source because they do not manufacture as a primary product any material listed in Subpart F, Table 1.

401 KAR 63:002, *40 CFR Part 63 national emission standards for hazardous air pollutants*, incorporating by reference 40 CFR 63.480 to 63.507 (Subpart U), N*ational emission standards for hazardous air pollutant emissions: group 1 polymers and resins*, does not apply to the source because they do not manufacture "elastomer product" as defined in 40 CFR 63.482.

401 KAR 63:002, *40 CFR Part 63 national emission standards for hazardous air pollutants*, incorporating by reference 40 CFR 63.520 to 63.529 (Subpart W), N*ational emission standards for hazardous air pollutants for epoxy resins production and non-nylon polyamides production*, does not apply to the source because they do not manufacture "basic liquid epoxy resin" or "wet strength resin" as defined in 40 CFR 63.522.

401 KAR 63:002, *40 CFR Part 63 national emission standards for hazardous air pollutants*, incorporating by reference 40 CFR 63.1310 to 63.1336 (Subpart JJJ), N*ational emission standards for hazardous air pollutant emissions: group IV polymers and resins*, does not apply to the source because they do not manufacture "thermoplastic product" as defined in 40 CFR 63.1312.

401 KAR 63:002, *40 CFR Part 63 national emission standards for hazardous air pollutants*, incorporating by reference 40 CFR 63.1400 to 63.1419 (Subpart OOO), N*ational emission standards for hazardous air pollutant emissions: manufacture of amino/phenolic resins*, does not apply to the source because they do not manufacture "amino/phenolic resin" as defined in 40 CFR 63.1402.

401 KAR 63:002, *40 CFR Part 63 national emission standards for hazardous air pollutants*, incorporating by reference 40 CFR 63.2430 to 63.2550 (Subpart FFFF), N*ational emission standards for hazardous air pollutants: miscellaneous organic chemical manufacturing*, does not apply to the source because this facility does not process, use, or produce (except as trace quantities in raw materials) any HAP listed in Section 112(b) of the CAA. See the determination conducted via email with U.S. EPA Region IV personnel included as additional information with the application.

EMISSION AND OPERATING CAPS DESCRIPTION:
None.

PERIODIC MONITORING:
See the permit for Specific Monitoring Requirements, by group.

OPERATIONAL FLEXIBILITY:
None.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.

APPENDIX A

SCREEN3 MODELING FOR AIR TOXICS COMPLIANCE WITH 401 KAR 63:020

Appendix A
SCREEN3 Modeling for Air Toxics Compliance

Procedural Summary

- Since multiple stacks and Insignificant Activities (i.e.: tanks, and other fugitives) exist, use of the U.S. EPA's Industrial Source Complex Short Term-3 (ISCST3) model would typically be required. However, a worst-case hypothetical emission situation was developed using only one emission point in order to allow the use of SCREEN3. Obviously, entering modeling data for only one point instead of many allowed the reviewer to expedite the modeling process, without sacrificing confidence in the results due to SCREEN3's conservativeness.

- For the hypothetical situation, source-wide emissions of all potentially hazardous pollutants listed on the POC table were assumed to "seep" fugitively from one tank. This hypothetical emissions scenario results in a very conservative modeling exercise because in reality most of the source's emissions are routed through the stacks, which aids dispersion. Additionally, dimensions of the smallest height and diameter tank were entered into the model to ensure a maximum emission rate and increase the conservative nature of the modeling scenario.

- Modeled results were compared to the U.S. EPA's Reference Concentration (RfC) listed in the Integrated Risk Information System (IRIS) database. Since the IRIS RfC is "An estimate … of a continuous inhalation exposure to the human population … that is likely to be without an appreciable risk of deleterious effects during a lifetime," SCREEN3 output was converted to annual concentrations to allow comparison to the RfC. This was accomplished by multiplying by a conversion factor of 0.08.

- Modeling of the source's PTE for potentially hazardous pollutants produces annual concentrations less than the RfC (See the selected modeling output and table in Appendix B).

APPENDIX B

RfC COMPARISON & SCREEN3 MODELING OUTPUT

Worst case hypothetical Air Toxics scenario: All emissions assumed to seep from one tank to allow SCREEN3 use.

Source-wide PTE emissions converted to g/(s*m^2) for modeling.

Rural option used in modeling.

Concentrations in ug/m3

Simple Terrain (ST) = 1-hr concentrations (unless "ANNUAL"). Annual Conversion Factor for ST = 0.08

Hypothetical "ooze" tank release. Smallest Ht. & Dia. Tank selected for max. em. rate (H = 9.14m, D = 1.83m, A = 10.51 m^2).

COMPOUND	PTE (TPY)	PTE g/(s*m^2)	ST @ 1 g/(s*m^2) SCREEN3	ST @ PTE	ST @ PTE ANNUAL	ISCST3 @ 1 g/(s*m^2) ANNUAL	ISCST3 PTE ANNUAL	IRIS RfC
Methanol	32.004	0.087599	17520	1534.730352	**122.7784282**	not req'd	not req'd	**1800**
Vinyl Acetate	6.458	0.017676	17520	309.689058	**24.77512464**	not req'd	not req'd	**200**

04/01/05
14:35:33
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

WACKER - B-87 @ 1 G/S.M**2

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = 1.00000
SOURCE HEIGHT (M) = 9.1440
LENGTH OF LARGER SIDE (M) = 3.2420
LENGTH OF SMALLER SIDE (M) = 3.2420
RECEPTOR HEIGHT (M) = .0000
URBAN/RURAL OPTION = RURAL
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = .000 M**4/S**2.

*** FULL METEOROLOGY ***

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*** SCREEN AUTOMATED DISTANCES ***
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*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
1.	.0000	1	1.0	1.0	320.0	9.14	13.
100.	.1689E+05	3	1.0	1.0	320.0	9.14	28.
200.	.1569E+05	5	1.0	1.0	10000.0	9.14	31.
300.	.1406E+05	6	1.0	1.0	10000.0	9.14	34.
400.	.1393E+05	6	1.0	1.0	10000.0	9.14	43.
500.	.1222E+05	6	1.0	1.0	10000.0	9.14	32.
600.	.1039E+05	6	1.0	1.0	10000.0	9.14	41.
700.	8800.	6	1.0	1.0	10000.0	9.14	39.
800.	7535.	6	1.0	1.0	10000.0	9.14	39.
900.	6519.	6	1.0	1.0	10000.0	9.14	41.
1000.	5696.	6	1.0	1.0	10000.0	9.14	41.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

86.	.1752E+05	3	1.0	1.0	320.0	9.14	26.

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*** SUMMARY OF SCREEN MODEL RESULTS ***
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CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	**.1752E+05**	86.	0.

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** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
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